

## CLAIMS :

1. An electric power controller for vehicle,  
comprising:

5 an overheat detector for detecting whether a power  
line supplying power from a vehicle battery to vehicle load  
is overheated;

a voltage detector for detecting a voltage of the  
vehicle battery;

10 a voltage converter for converting power from the  
vehicle battery into a proper voltage and outputting a  
switching control signal reflecting the proper voltage;

a switching unit for performing ON/OFF switching  
operations based on the switching control signal to control  
15 power from the vehicle battery to the vehicle load; and

a controller for inputting an overheat signal from the  
overheat detector and the voltage from the voltage detector,  
determining whether there is an abnormal current, and  
outputting a switching control signal, corresponding to a  
20 result to analyze a change of the voltage, to the switching  
unit.

2. The electric power controller as set forth in claim  
1, wherein:

25 the controller outputs determination information of

the abnormal current according to the change of the voltage;  
and

the electric power controller further comprises a  
diagnostic information output unit for storing the  
5 determination information of the abnormal current and  
outputting the same to an external vehicle controller.

3. The electric power controller as set forth in claim  
1, wherein the controller controls the switching unit to  
10 switch its OFF state to its ON state when receiving a reset  
signal from an external vehicle controller.

4. The electric power controller as set forth in claim  
1, wherein the voltage detector outputs the voltage to an  
15 external vehicle controller.

5. The electric power controller as set forth in claim  
1, wherein the voltage detector comprises:

an element for measuring a voltage of the vehicle  
20 battery; and

an amplifier for amplifying a voltage difference  
between terminals of the element.

6. An electric power controller for a vehicle,  
25 comprising:

an overheat detector for detecting whether a power line supplying power from a vehicle battery to vehicle load is overheated;

5 a voltage detector for detecting a voltage of the vehicle battery;

a voltage converter for converting power from the vehicle battery into a proper voltage and outputting a switching control signal reflecting the proper voltage;

10 a switching unit for performing ON/OFF switching operations based on the switching control signal to control power from the vehicle battery to the vehicle load; and

a controller for inputting an overheat signal from the overheat detector and the voltage from the voltage detector, determining whether there is an abnormal current, outputting  
15 a switching control signal, corresponding to a result to analyze change of the voltage, to the switching unit, and adjusting occurrence intervals of switching control signals, corresponding to respective ON and OFF states, to control the magnitude of effective value of vehicle power supplied  
20 to the vehicle load via the switching unit.

7. The electric power controller as set forth in claim 6, wherein:

the controller outputs determination information of  
25 the abnormal current according to the change of the voltage;

and

the electric power controller further comprises a diagnostic information output unit for storing the determination information of the abnormal current and outputting the same to an external vehicle controller.

8. The electric power controller as set forth in claim 6, wherein the controller controls the switching unit to switch its OFF state to its ON state when receiving a reset signal from an external vehicle controller.

9. The electric power controller as set forth in claim 6, wherein the voltage detector outputs the voltage to an external vehicle controller.

10. The electric power controller as set forth in claim 6, wherein the voltage detector comprises:

an element for measuring a voltage of the vehicle battery; and

an amplifier for amplifying a voltage difference between terminals of the element.

11. The electric power controller as set forth in claim 6, wherein the controller adjusts occurrence intervals of switching control signals corresponding to respective ON

and OFF states if the vehicle battery outputs a transient current, so as to reduce a magnitude of power supplied to the vehicle load.

5           12. An electric power controller for a vehicle, comprising:

          an overheat detector for detecting whether a power line supplying power from a vehicle battery to the vehicle load is overheated;

10           a voltage detector for detecting a voltage of the vehicle battery;

          a voltage converter for converting power from the vehicle battery into a proper voltage and outputting a switching control signal reflecting the proper voltage;

15           a switching unit for performing ON/OFF switching operations based on the switching control signal to control power from the vehicle battery to the vehicle load; and

          a controller for inputting an overheat signal from the overheat detector and the voltage from the voltage detector, 20 determining whether there is an abnormal current, and outputting a switching control signal, corresponding to a result to analyze change of the voltage, to the switching unit,

          wherein the electric power controller is installed in 25 a printed circuit board of a junction box and electrically

connected thereto.

13. The electric power controller as set forth in claim 12, wherein the electric power controller is integrated with the junction box as compliant pins of the electric power controller are inserted into throughholes in the printed circuit board of the junction box.

14. The electric power controller as set forth in claim 12, wherein:

the controller outputs determination information of the abnormal current according to the change of the voltage; and

the electric power controller further comprises a diagnostic information output unit for storing the determination information of the abnormal current and outputting the same to the outside.

15. The electric power controller as set forth in claim 14, wherein the diagnostic information output unit notifies an external vehicle controller of the determination information of the abnormal current.

16. The electric power controller as set forth in claim 12, wherein the controller controls the switching unit

to switch its OFF state to its ON state when receiving a reset signal from an external vehicle controller.

17. The electric power controller as set forth in claim 12, wherein the voltage detector outputs the voltage to an external vehicle controller.

18. The electric power controller as set forth in claim 12, wherein the voltage detector comprises:

an element for measuring the voltage of the vehicle battery; and

an amplifier for amplifying a voltage difference between terminals of the element.

19. The electric power controller as set forth in claim 12, wherein the controller adjusts occurrence intervals of switching control signals corresponding to respective ON and OFF states to control the magnitude of effective value of the vehicle power supplied to the vehicle load via the switching unit.

20. The electric power controller as set forth in claim 19, wherein the controller reduces a magnitude of power supplied to the vehicle load if the vehicle battery outputs transient current.

21. An electric power controller for a vehicle,  
comprising:

an overheat detector for detecting whether a power  
5 line supplying power from a vehicle battery to loads is  
overheated;

a voltage detector for detecting a voltage of the  
vehicle battery;

a voltage converter for converting power from the  
10 vehicle battery into a proper voltage and outputting a  
switching control signal reflecting the proper voltage;

a switching unit for performing ON/OFF switching  
operations based on the switching control signal to control  
power from the vehicle battery to the vehicle load; and

15 a controller for inputting an overheat signal from the  
overheat detector and the voltage from the voltage detector,  
determining whether there is an abnormal current, and  
outputting a switching control signal, corresponding to a  
result to analyze a change of the voltage, to the switching  
20 unit,

wherein the electric power controller is installed in  
a printed circuit board of a junction box, and electrically  
connected thereto by a line connector such that one end of  
the line connector is connected to an input/output interface  
25 terminal of the printed circuit board and the other end



thereof.

22. The electric power controller as set forth in claim 21, wherein:

5       the controller outputs determination information of the abnormal current according to the change of the voltage; and

10       the electric power controller further comprises a diagnostic information output unit for storing the determination information of the abnormal current and outputting the same to the outside.

23. The electric power controller as set forth in claim 22, wherein the diagnostic information output unit  
15       notifies an external vehicle controller of the determination information of the abnormal current.

24. The electric power controller as set forth in claim 21, wherein the controller controls the switching unit  
20       to switch its OFF state to its ON state when receiving a reset signal from an external vehicle controller.

25       25. The electric power controller as set forth in claim 21, wherein the voltage detector outputs the voltage to an external vehicle controller.

26. The electric power controller as set forth in claim 21, wherein the voltage detector comprises:

an element for measuring a voltage of the vehicle battery; and

an amplifier for amplifying a voltage difference between terminals of the element.

27. The electric power controller as set forth in claim 21, wherein the controller adjusts occurrence intervals of switching control signals corresponding to respective ON and OFF states to control the magnitude of effective value of the vehicle power supplied to vehicle load via the switching unit.

28. The electric power controller as set forth in claim 27, wherein the controller reduces the magnitude of power supplied to the vehicle loads if the vehicle battery outputs a transient current.